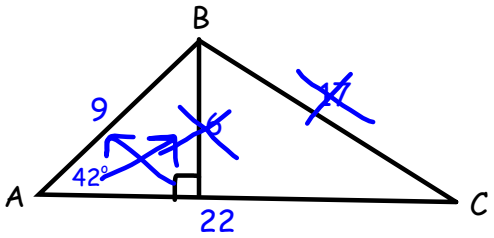
HW: Aim 62 Worksheet; Quiz Tuesday, 3/6 on Aims 61 - 66

Aim #62: How do we find the area of a triangle given the lengths of two adjacent sides and the included angle?

Kickoff:

Find the area of triangle ABC. Hint: There is extra information!



$A = \frac{1}{2}bh$

$= \frac{1}{2}(22)(6)$

$= 66$ sq. units

Sep 4-8:29 PM

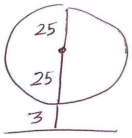
1. Write the equation of a sine function that has the following characteristics.
   a. Amplitude:2 Period: π Phase Shift: ½ to the right

$y = 2\sin 2(x - \frac{1}{2})$

2. Write the equation of a cosine function that has the following characteristics.
   a. Amplitude: 3 Period: $\pi/2$ Phase Shift: 2 to the left

$y = 3\cos 4(x+2)$

3. A Ferris Wheel with a radius of 25 feet is rotating at a rate of 3 revolutions per minute. When t=0, a chair starts at the lowest point on the wheel, which is 5 feet above the ground. Write a model for the height h, in feet, of the chair in terms of time t, in seconds.

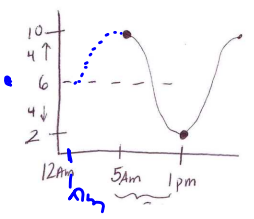


$y = -25\cos\frac{\pi}{10}t + 30$

3 rev ⇒ 60 sec $b = \frac{2\pi}{20} = \frac{\pi}{10}$

1 rev ⇒ 20 sec (per.)

4. The height of the water in a bay varies sinusoidally over time. On a certain day off the coast of Maine, a high tide of 10 feet occurred at 5:00 A.M. and a low tide of 2 feet occurred at 1:00 P.M. Write a model for the height h (in feet) of the water as a function of time t (in hours since midnight).



$a = 4$

$m_L = 6$

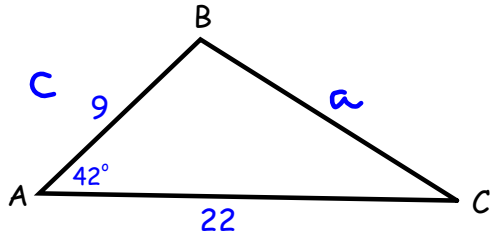
$y = 4\cos\frac{\pi}{8}(t-5) + 6$

per = 16 hrs

$b = \frac{2\pi}{16} = \frac{\pi}{8}$

Feb 26-2:39 PM

What if we were only given this much information about the triangle?



$$K = \frac{1}{2}ab\sin C$$

b

$K = \frac{1}{2}bc\sin A$

$K = \frac{1}{2}(22)(9)\sin 42$

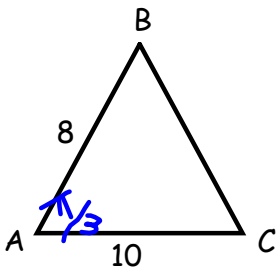
$K = 66$ sq. units

K
Area of a Triangle

https://www.youtube.com/watch?v=0bvr4DkKREM

Mar 6-5:13 PM

Try: In $\triangle ABC$, b = 10, c = 8 and angle A = π/3. Determine the exact value for the area of the triangle.



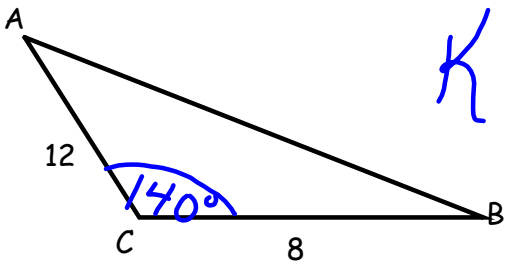
$K = \frac{1}{2}bc\sin A$

$= \frac{1}{2}(10)(8)\sin\frac{\pi}{3}$

$40\frac{\sqrt{3}}{2} = \boxed{20\sqrt{3}}$

Mar 20-5:26 PM

Try: In $\triangle ABC$, a = 8, b = 12 and angle C = 140°. Determine the area of the triangle to the nearest square unit.



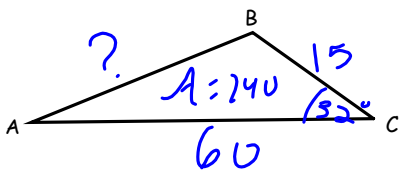
$K = \frac{1}{2}ab\sin C$

$K = \frac{1}{2}(8)(12)\sin 140$

$= 31$ Sq. units

Mar 20-5:26 PM

eg. In $\triangle ABC$, a = 15 and b = 60. Find the measure of angle C to the nearest degree if the area is 240 square units.



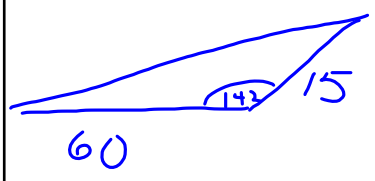
$K = \frac{1}{2}ab\sin C$

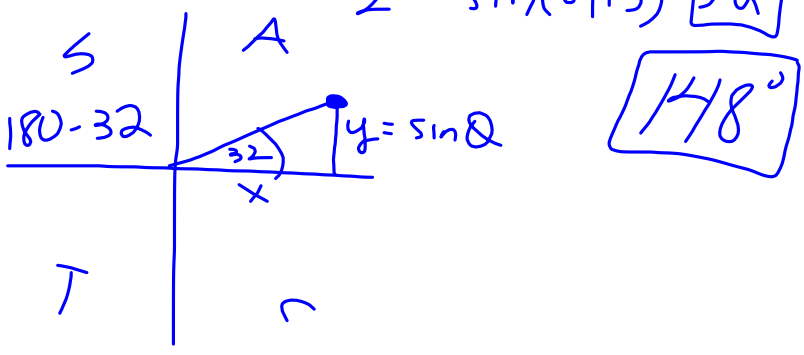
$240 = \frac{1}{2}(15)(60)\sin C$

$\frac{240}{450} = \frac{450}{450}\sin C$

$8/15 = \sin C$

$2^{nd}\ \sin(8/15) = 32°$





148°

Mar 20-5:26 PM

What is the maximum possible area of a triangle that has side lengths of $\sqrt{10}$ and $2\sqrt{5}$?

$K = \frac{1}{2}(\sqrt{10})(2\sqrt{5})\sin X$

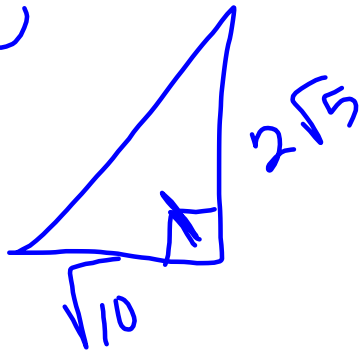
$\frac{1}{2}(\sqrt{10})(2\sqrt{5})$

$\sqrt{50}$

$5\sqrt{2}$

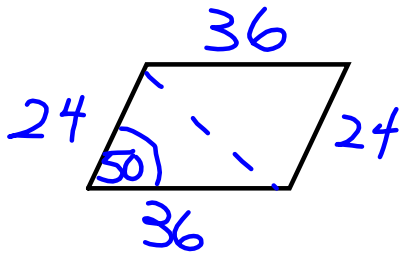
$\sin X$

1



Dec 6-8:23 AM

The lengths of two sides of a parallelogram are 24 and 36 centimeters. Their included angle measures 50°. Find the area of the parallelogram to the nearest sq. centimeter.



$K = ab\sin C$

$= (24)(36)\sin 50$

$=$

Answer

Feb 5-7:35 PM

In triangle ABC, the ratio of side AB to side AC is 1:2 and angle A = 30° . If the area of triangle ABC is 200 square feet, find the length of side AC to the nearest foot.

Dec 6-8:24 AM